20. That the *Perſians* are exquiſitely skilful in damaskining with Vitriol; but that the nature of the Steel by them uſed contributes very much to the good workmanſhip, they not being able to do ſo well with their own or our Steel. This Steel they fetch from *Golconda*, which is the only kind known that can be well damaskined. And 'tis very differing from ours: For, when 'tis put to the fire to temper it, they very carefully give it only a little redneſs like that of a cherry-colour, and inſtead of quenching it in water, as we do, they only wrap it in a wet piece of Linnen cloth; for, if they ſhould give it the ſame degree of heat that we do to ours, it would grow as brittle as glaſs.

21. That the *Perſian* Countrymen about *Iſpahan*, coming every morning to fetch away all manner of the ordures of the Town to dung their land withal, take up much rather the excrements of the *Armenians*, *Jews* and *Franks*, becauſe they drink wine, than thoſe of the *Perſians*, that generally drink none.

22. That in *Perſia* they make the running of Foot-men a Trade, by breeding them up to it, and with ſolennity receiving him for Maſter of the Trade who performs the Maſter-piece of running 36 common Leagues in a day, from Sun-riſing to Sun-ſetting.

So far the Obſervations of the firſt Volume; *thoſe of the* ſecond *we ſhall reſerve for the next opportunity.*

A Deſcription of Mr. John Coniers, *Apothecary and Citizen, his* Hygroſcope, *in two ſeveral Contrivances; together with ſome Obſervations made thereon: Communicated in a Letter to the Publiſher,* Octob. 23. 1676.

SIR,

I Thought it neceſſary to acquaint you, that in my diverſions, among many (at leaſt 40) ſeveral Trials, made by me for the readieſt and beſt diſcovery of the Change or Temperature of the Air and Weather, I have found out, that by applying a Hand and a Circular Index or a Quarter-circle to a Pannel made of duly ſeaſoned Deal-wood, and that divided or ſlit in two parts playing looſe in a groove, and only faſtned to the frame at each end (as you may ſee by the figures, accompanying theſe lines,) you have one of the beſt, if not the very beſt contrivance for that purpoſe. I have made two ſeveral Contrivances of it; the one I invented and contrived about five or ſix years ſince; here explained in the firſt Figure, together with ſome Obſerva-

tions

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tions, by me made thereon during that time; the other, ſome years after the former: Both which I thought fit to communicate to you, to diſpoſe of them as you ſhall think good.

So far the Letter: Which, together with the Invention and Contrivance it ſelf, therein mentioned, the Publiſher would have given notice of ere this, and at the time, when in *N.* 127. of theſe Tracts the like Invention, imparted from *Dublin*, was deſcribed, if he had not then been altogether un-acquainted therewith. Wherefore, to do right to the Ingenuity of this Inventor, the Deſcription of this his Inſtrument, in its two ſeveral contrivances, ſhall now be faithfully ſet down here, together with the Obſervations made by the former of them.

The Explanation of the firſt Contrivance in Figure I.

AAAA, The Frame of wood for the two pannels of Deal to play looſe in at top and bottom, to which at the two ends they are faſtned.

BB, The two pannels of ſlit-Deal, three foot deep, and three foot broad apiece, with a diſtance left in the middle for the ſcope of the motion.

C, The Hand placed or faſtened by the Axletree to the plate, and alſo with Nail-holes which are to faſten it to the middle of the Pannel within half an inch of the ſcope for motion; at the lower or ſhorter end of which Axletree there is, by a wire like an S, faſtned a ſmall Silver-chain within a ſtraws breadth of the Axletree; which Chain is to be carried and placed croſs the diſtance between the two pannels, and faſtned to the Pannel oppoſite by a braſs nooſe, through which it is to ſlip, ſo as that it may be taken up or let down at pleaſure.

D, The Roller with a weight annexed, which by a ſtring is faſtned to the loweſt end of the hand C; ſo that as the Relax gives way, the Weight will adjuſt the motion of the hand to the Index E.

E, The Index of Paper, paſted upon the oppoſite pannel to the hand, and ſo, as it is in this figure, placed near the top, for the better advantage of the Hands motion; and this Index, being but a quarter of a Circle, is divided into inches more or fewer according to the ſcope which the Pannels hand requires for their motion; but when the Relax ſhall require more room for the hand, then the chain is to be taken up one link more, and

ſo

ſo you will be ready for more play upwards and downwards: Which taking up may yet be again repeated, when there is occaſion, or the time of year requires it.

Now if the Chain be placed near the Axletree, the motion will be the nicer and larger; if farther off, then it will be leſs: For Example, the motion of 2 more than that of 3, and 3 than that of 4, &c. as you may perceive by the figures 2, 3, 4, 5, 6; which are placed in this figure by the lower end of the hand near below the Axeltree thereof.

From this contrivance it was, that I have for this five or ſix years paſt made theſe following Obſervations.

1. That theſe Pannels of Deal-wood will move by ſhrinking moſt in Summer, and ſwelling moſt in Winter-ſeaſons; but will vary from this, according to the change to the then more or leſs heat or cold, moiſture or drought that the temper or ſeaſon of the year, ſuch as Spring and Fall, do produce; it being then more apt to ſwell or ſhrink on the ſudden, but not attaining then to the higheſt ſhrinking or ſwelling, as in Summer and Winter it doth.

2. That for the moſt part, eſpecially in the Spring and Summer-time, this Motion happens only in the day time; for then generally all night it reſts, and moves very ſeldom.

3. That one kind or manner of this Motion happens in dry fair weather, but ſometimes in the fore-part of the forenoon, and ſometimes not until the latter part of the forenoon, and then at that time it relaxes or ſwells the Deal for about two or three hours; more, ſeldom; leſs, often; and then all the afternoon after ſhrinks; nay, ſometimes even when a ſmall Rain hath newly fallen, or is then falling; and this not ſo often, but more ſeldom in Winter, or cold moiſt weather.

4. This ſhrinking is gradual very often, or for the moſt part a little after a moiſt time (*viz.*) the firſt day after moiſture it ſhrinks a little, the ſecond day more, and ſo yet more according to the then time of year, and as it is then inclined to moiſture or drought, and alteration of the wind and the then heat or cold.

5. The winds being in the North, North-Eaſt, and Eaſt, winter and ſummer, for the moſt part at that time the Deal ſhrinks in the night alſo as well as in the day; but not ſo much: which is a ſign of drying weather, and ſometimes of froſt or cold in Winter; heat or ſcorching in Summer, in a clear day. But on the contrary, the

Southwinds blowing, or the Weſt and South-weſt, the Deal then alwaies relaxes that day, or at leaſt is at a ſtay, provided this happen in the day time; for then, if in the night, not ſo much; and ſo this will do ſome conſiderable time before Rain.

6. By a conſtant obſervation of this Experiment of the Deals Motion and Reſt, you may be able to know or gueſs at the Winds ſcituation without a Weather-cock, provided you have by you a common and a ſealed *Thermometer*.

7. Alſo you may know the time of Year; for in the Spring it moves quicker and more than in Winter; in Summer it is more ſhrunk than in the Spring; in Autumn leſs in motion than in the Summer. Other Obſervations may be made more nice; theſe only in general at preſent.

Only I ſhall add this following Experiment with a Conjecture from thence. Conſidering with my ſelf, that a Fagot or other Wood laid upon the fire, the heat then viſibly cauſes moiſture to come out of the Ends only. This occaſioned the making of the following Experiment, to find whether then the moiſture was not rarified out of the ſmall Cylinder, like ends of the wood, only, or out of the ſides alſo.

I took therefore ſeaſoned Deal, two pieces, weighing the one piece and the other the night before; but the *ends* of the one piece I cloſed up with *Diachylon Plaſter*, but the *ſides* of this Deal I did not ſo cloſe up; but left theſe ſides with the other piece without *Diachylon*. Both being expoſed to the open Air, they were found the next day both of them alike to have increaſed in proportion of Weight, which ſeems to prove, that the Sides alſo do take in and let out Moiſture. Yet it doth appear, that in warmer weather Moiſture paſſes freeſt and more out of the Ends of the wood, than it doth in colder weather.

From whence I do conjecture, that Deal-wood, as it hath a fit texture and body for *moiſture* and *drought*, *heat* and *cold* and ſuch like qualities to be diſcovered thereby, ſo it doth much like the ſame thing with what is alſo performed by the whole body of the outward maſs of this globe of Earth; as may be made appear by forty other Experiments, not commonly known; yet this varying according to the time of year, and clime in Longitude and Latitude.

The

The Explanation of the Second Contrivance, by a Circular Motion for an Annual Revolution; and firſt *in the* Outward *parts; repreſented in Fig.* II.

AAAA, The frame of wood, for the Pannels of Deal to play looſe in, at top and bottom.

BBBB, The Croſſes of Deal or Iron faſtened to the frame on each ſide; to which is annexed the Circular Index divided into 12; in the Center of which the Axletree *b* for the hands is placed.

CC, The two Pannels of ſlit-Deal, 3 foot deep, and 3 foot broad, apiece; faſtened at each end of the Frame, with a diſtance left in the Middle for the ſcope of the Motion.

The Explanation of the Inward *work in Fig.* III.

AA, The two hands.

BB, The two Braſs Pullies or Rollers, the one bigger, the other leſs; to the bigger a flat Leaden-weight is faſtened with a Cat-gut ſtring; to the ſmaller is faſtened a ſmall Silver-chain, which is by the Nooſe or loop of the braſs *C* to be faſtened to the Pannel under the middle of the croſs, near the gap or ſcope for the Motion; and in that nooſe the Chain to have a faſtening to be taken up or let down at pleaſure.

D, The Roller or Pully to be placed on the other Pannel oppoſite to the Nooſe, and near the gap or ſcope betwixt the two Pannels; over which Roller the ſmall Chain, upon its return to the Axle-tree, is to be placed.

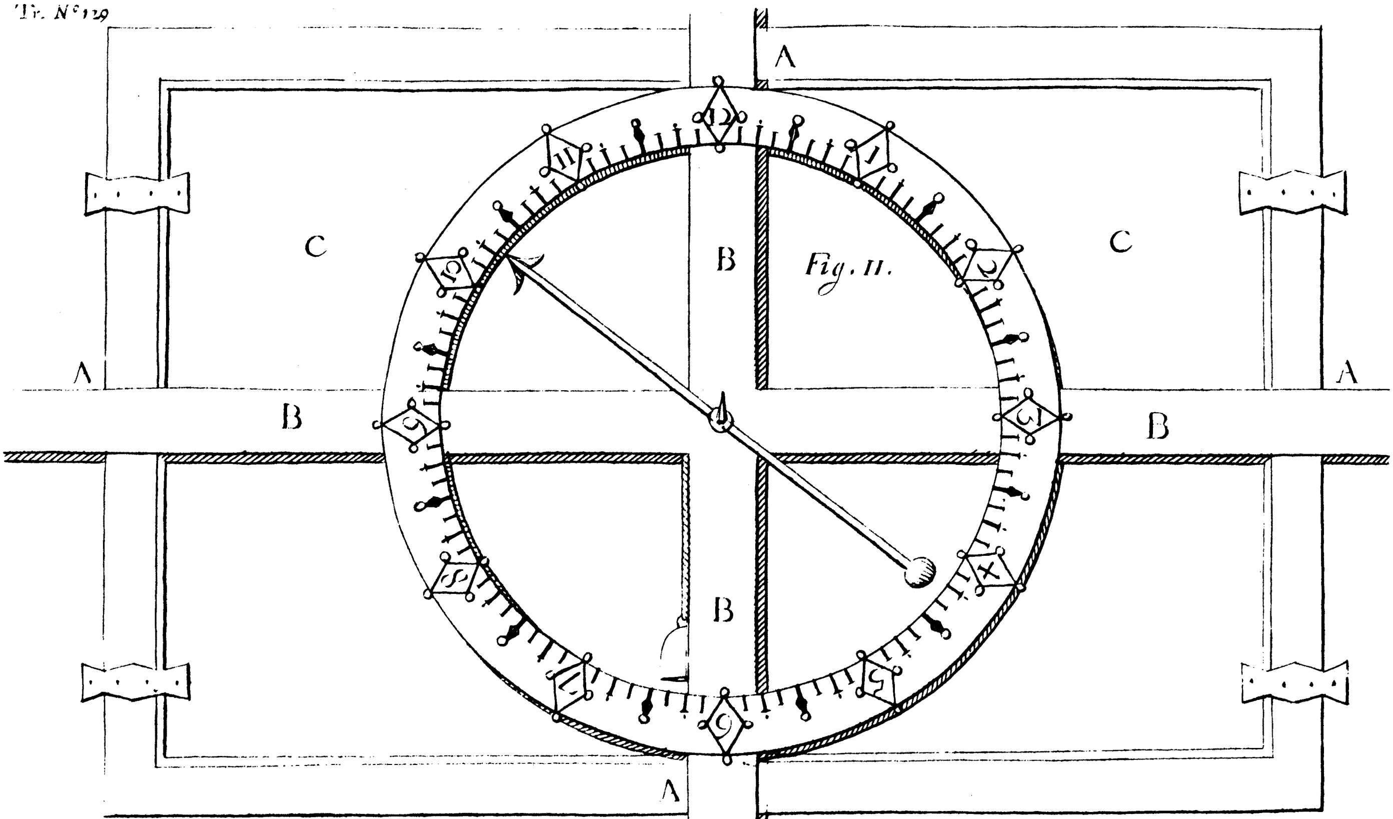
E, The Axletree upon which the two Rollers or Pullies *B, b*, are to be faſtened, and the two hands *A A* for the Index.

F, The Weight annexed to the biggeſt Roller or Pully *B*, and the ſtring or Cat-gut to be moved, is to have the contrary poſture for motion to the ſmall Roller or Pully upon which the Silver-chain is faſtened: ſo that, as the ſhrinking of the Pannel moves the Axletree one way, the Relaxing may give way to the moving the hands or Axletree the other way by the power of the Weights drawing; which contrary poſtures will give the niceſt account of this Motion.

Note, that the circumference of the ſmalleſt Pully or Roller *B b*, upon which the Chain is faſtened, is to be no bigger than juſt ſo much ſcope or diſtance as the two Pannels make by the extremity of their utmoſt ſwelling or ſhrinking; and ſo one full revolution of the hand upon the Index may anſwer the fulleſt ſhrinking and ſwelling in the year, and the diſtance between the two Rollers or Pullies fixed upon the Axletree muſt be the thickneſs of your Pannels; ſo that the Weight is to play or move on the one ſide of the Pannel, and the Chain on the other, without diſturbance or rubbing againſt the ſides of the Pannel or the Croſs, between which, out of ſight, in the middle they are to be placed.

This way was ſo contrived before this time twelve-month, in the year 1675; ſome years after the former; and ſo with Chain and Pullies to avoid the ſhaking that would happen by applying the work of Pinnion and teeth to move the hands; which was then alſo propounded to Mr. *Tompion* the Watchmaker, but by him rejected, though I think that way may be uſed alſo with a Weight added to regulate the motion.

Now, as to the degree, to which the Deal-board, which ſhall ſerve for theſe Inſtruments, is to be ſeaſoned, and for the kind, of which the ſame ought to be, you muſt take the fineſt ſtreighteſt grain of your Dram-deal, as the beſt for this uſe, and let it lie drying in your houſe two or three years. And to know, whether it be ſufficiently ſeaſoned for this Inſtrument, take a ſmall part thereof, and weigh it in a nice pair of Scales, and, if you find the weight thereof not to have increaſed many grains in wet weather, nor decreaſed many grains in dry, you may then conclude this Wood to be fit for your purpoſe.


A
C
B
Fig. II.
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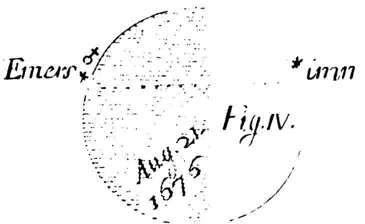
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Fig. IV.
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1675

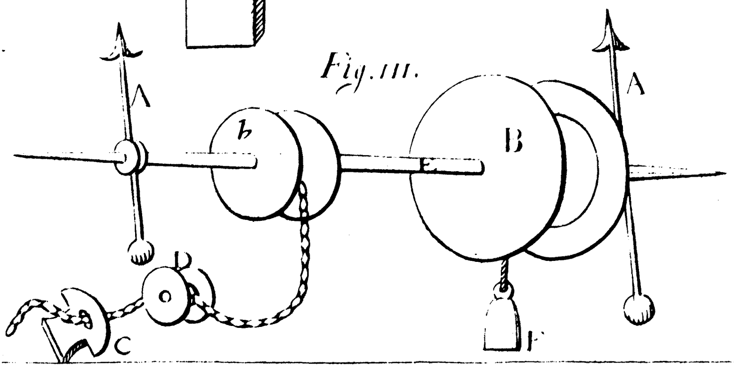
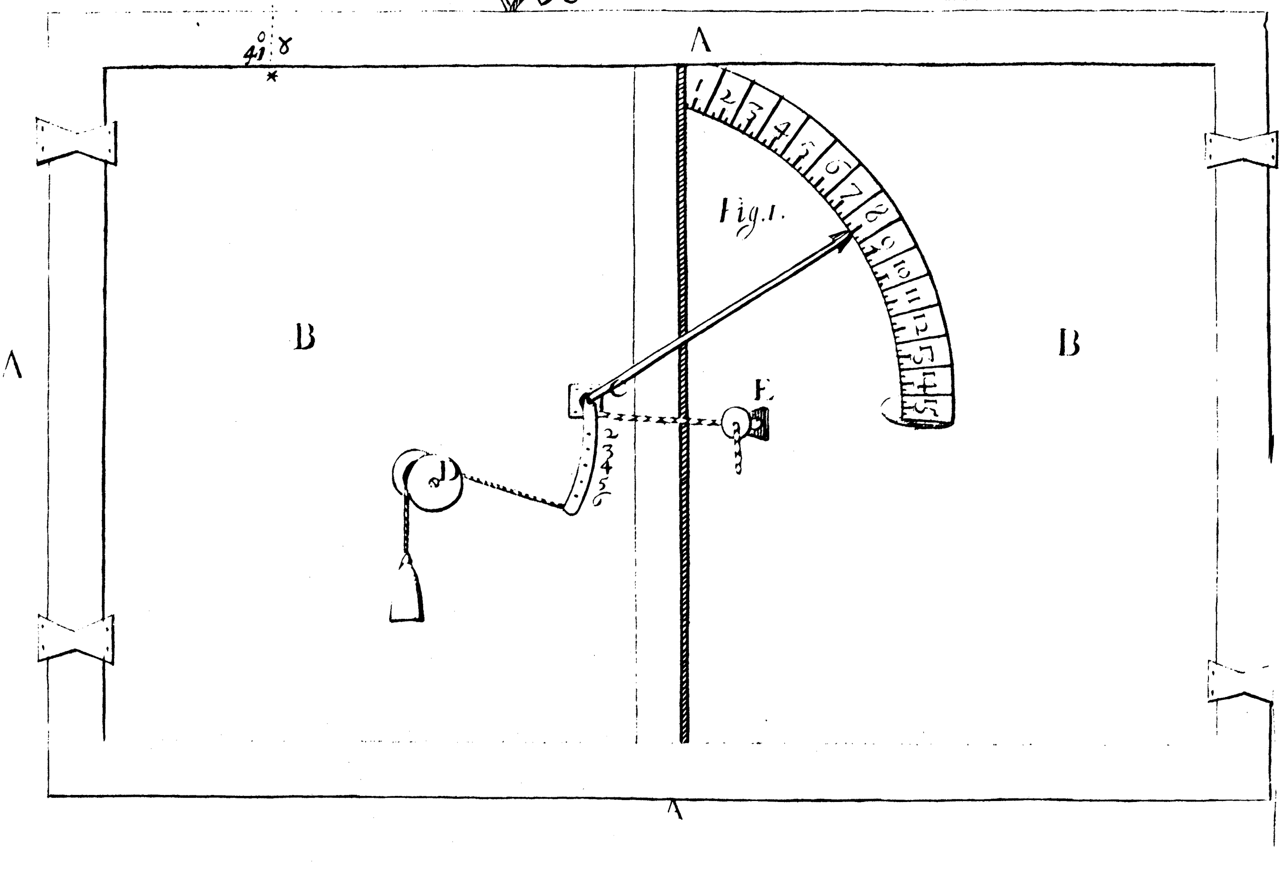


Fig. III.
A
b
B
A
D
C
F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A
Fig. I.
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